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portion at the surface of the rotating Sun, and designate the mean velocity of retarded oscillation by v_1; the velocity of infinite fall by v_2; under any assumed expansion or contraction of the Sun's mass, $v_1 \propto \frac{1}{r}$,* while $v_2 \propto \sqrt{\frac{1}{r}}$. If we wish to find the limiting velocity v^0 for the value of r, ($r^0 = r \div x^2$), which renders $v_1{}^0 = v_2{}^0$, we have the equation

$$v^0 = v_1{}^0 = v_2{}^0 = v_1\, x^2 = v_2\, x$$

$$\therefore x = v_2 \div v_1$$

Taking Norton's estimate of solar radius (425,061.5) the value of v_2 is 375.5 miles per second, and various estimates of the time of solar rotation give the following values of v_1 and v_0.

	v_1	v_0
Spörer	.799	176,440
Carrington	.788	178,920
Lelambre	.787	179,210
Faye	.785	179,660
Petersen	.781	180,470
De La Rue, Stewart and Loewy	.781	180,560
Herschel, (Bianchi and Laugier)	.777	181,460
Harmonic prediction ($\frac{7}{26}$ ⊕)	.771	182,800

The velocity of light, as deduced from Norton's value of solar radius, is 183,450 miles per second, which is approximately identical with the limiting velocity, v_0.

TRANSCRIPT OF A CURIOUS MANUSCRIPT WORK IN CYPHER, SUPPOSED TO BE ASTROLOGICAL.

By Pliny Earle Chase.

(*Read before the American Philosophical Society, October 3d*, 1873.)

The work, of which I have prepared the accompanying transcript, was bought in Amsterdam, about seventy years ago. It consists of forty-four manuscript pages, on twenty-four triangular leaves of parchment, measuring nine inches on a side, substantially bound in a hog-skin cover. It has been kept in a plush-lined tin case, so that it is in a state of excellent preservation, and appears as if newly written. On the lid of the case is a figure of a dragon, together with the following inscription, greatly defaced, but still distinct enough to be perfectly legible.

"Ex Dono Sapientissimi Comitis St Germain Qui Orbem Terrarum Percucurrit."

The cypher consists of twenty-six arbitrary characters. In preparing to transcribe it, I counted the number of times each character was used, substituting *a* for the one that occurred most frequently, *b* for the next in frequency, and so on. The words are often run together, but there are numerous breaks, which I have indicated, some of which appear to mark divisions between words, while others may be arbitrary, or intended as blinds.

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* In consequence of the law of equal areas.

1

jbnbrgacbgfeadaoajaa
bni w adaedihoaakbfc
hfniflhn afe asgmeg
afsmd alg ahc an
afe lifc ad oaa
afbcga lihl
jbkaogca
khf
kdbsif
bgja

2

jid
pgea
qhaeho
igc bjb mb
ramd alakaf
eaeac ad ogdb
kanikajamihd a
ftbgd akbhedc bhx qh
ajcehkiffad bcfahtpihk
aackajbdrahd ehaftadbc
hcbra mihdimad ad kacnad

3

xagjjac tboahdqhafife mbc
aha padic s cbflifg beif
eac md akalaccahdc vaea
kiffa afnanaeanmcj
vfeajjgraflakhlb
dblead akifeace
aldgenbdaoaj
begif btgf q
ha ehtadbc
hcbramd
edigc
lui
ca
c

4

md
edih
oadja
cluicac
madkhackbf
c jac nadcka
mhgc japihjoad
canafekhrjipa
md kalih odgdkac ngfac
kakgbnbfec kidskbdrafe
kbfc jac agfkajbeadda

5

md lifcadoad jbcbfea s mdiji
frad jb oga vhcqhbhf cgal
jasbhkajbboal jbtdbg
luahdka lgfqhbfea b
fcsjbtidlakalae
bra
ehtadbc eacima
dbegifc mih
d jackahx
mdangac
ipv
aec

6

ei
heac
jacti
gcqhaja
cijagj jb
eaddas jb jhfa
caedihoadife afl
ifviflegif chd jb
nanajgrfa skbfc jana
namjbf qhbfe bjb edigcg
ananad oag jjaeh mihdd bc jc

7

tbgda afeihebhedaeanmc nbgc
gjtbhkdbmideadchd eig hfa
tgrhdacanpjbpja blajja
qhaeh oigc glg
(in an astrological diagram)
bjmub s inarb

8

eh
mdaf
kdbchf
obca mdi
mdafgnmidea
ka qhajjanbe
gada ehjadanmjg
dbcka tah qhaehaxi
dlgcadbckajbnbfga
dachgobfea
itahld abehdavaeaxidlgca

9

mbd lajhg mbd qhg eiheac luic ac
ife aeatbgeac btgf qhaehaji
grfakaeig eihe mubfeina
pafgc ja i mad oaeadfaj md
jb rjigd aka eif fin c
bgfes mad nbfafe
eig qhg ogc sd
arfac kbfcei
hc jac cg
aljacka
ccga
lja
c

10
hf
jao
geaqha
ehbhd bc
boal eig da
mifkdb bnaf
ehpafgdbc afchge
akajaflafc sqhbeda
jbnmac ka jb nbfgadac
hg obfea ikgahaeadfaj ae
dacihoadbgf pafgc lae aflafc
slac jbnmacbtgf qhajahdti

11
dlasjahdoadehbhrn afeafe ldbge
a qha jahdc affangcf wmhccafe
afedadeig qhg ogc sdarfac
kbfc eihc jac cgaljac k
ac cgaljac eifjaogead
amifkdb bnaf
eh oadcadbclae
aflafc pafgc
hd jatahs
ehbjjhn
adbc
eac
j

12
bn
mac
bobfeea
cimadbe
gifc
jamaegeidpge
aliflafedgqha
ace ja jg ahihehea
eg afkdbc mafkbfeeac
imad egifc jbhed aidpg
eaqhg ace bh kac cihc ace
jb mjbla qillhmadbeifjaogea

13
ehcadbcoaehlinnabh xvihd
ckac ladanifgackac cbldg
tglac af afedbfekbfceif
idpgeaeh bhdbc afebnb
gfrbhlua jbtgrhdacea
(in astrological diagram)
brjb brjb eaedrbnnbeif

14
eifjaogeeachgodb af mid
ebfe jb damdacafebeg
if kac lbdblea
d ac kad aoaj
beg if
jidcqha
ehca
db
c

15
d
afk
hbjbm
jbla qhg
e ace kaceg
fa ehd anaeed
bc beif jaogeaj
btgrhda boal jb qha

16
jjaeh aeigc afed a bji
dc eif jaogea bgbfe
aeaillhmad jbc
gaffaehpafgdb
ceifidpgea
af mditadb
fe lacm
bdij
ac

17
cb
ldaac
fiein
bdrdeae
pafgclaeidp
gea pafgc-ja
wbfikb pafgc-ja
ngija pafgc-ja
bjbr pafgc-ja

18
cieugi pafgc-ja
cidgzgc pafgc-ja
bmubj pafgc-ja
brani pafgc-ja
euipbccb
pafgc-ja
bdgy
pafg
cja

19
p
bzi
db eig
qhg ogcs
darfac kbfce
ihc jaccgaljac
kaccgaljac eifj
aogeadamifkdb bnaf
afchgeaehgfoi qhadbcja

20
cjac acmdgec bqhgvbg
kiffa ja mihoigdkam
dacgkad bhuxkajbfh
ge aflinnaflbf
ekh lieaihca
jaoajacij
agj saf
kgcb
e

21
j
abnbf
jalgbp
pbedbfbogi
dgpdbj
eajbdi
khlieaihc alihl
ua ja cijagj

22
ajbfb
jambp
hcebaj
euaddhp
ciebdali
gjgpbmbl
kh liea
jamj
hc

23
a
jaha
kajidgea
jagb
ajgfb
bngrbpgdaj
kh liea ja mjhcpbc
kajidpgea
makghpbz

24
tgbjalubn
lu bdcgaj
ehtadbc aflidkhliea
ihc ajaoajacijag
j jgfoi lbegif
chgobfea mdi
ceadfaoad
ejbead
da

25
fih
coihc
gfoiqhi
f wbjbenb
sjangdie
jalgbpseajbd
uadgpbrs bdfiogi
edbpb s bgie
bfgaj sjakgnbe

26
vbfbajs lbjybc
jabci s ogbfiaj
sfihc oihcidkiff
ifc mbd lajhgmbd
qhg eiheacl
uic acife
aeatbge
csmbd
eih
c

27
jac
bheac
fincka
j aeafajs
mbd lajhgka
wbfikb
aj
nguijac
uijba yapieu

28
fijgl cbz
s fiebnnbdrbeae
qhg acejac agrfa
hdkg ah ajaoa ka
oihcdamdaca
fead md ack
alaeidp
geag
fog
c

29
gp
jan af
e skana
tbgdaliff
igeda mbd hfa
vhcea gfcmgdbeg
if cgoihcn afvhr
akgrfa mhdaeakanif
bna mbdjb jac jg ahxih

30
gj wbkac ngfack akgb
nbfe kid skbdrafe la
hxqhg dalajafeka
cluicac mdalg
ahcac madkha
ckbfcjac nadc ka
mdiji
fra
d

31
nb
ogac
bgfasv
hcqhbhkajb
khf cgalja va
oihckanbfkal
actboahdc cbfc qh
ava aflihdafgkbfrad f
gdgcqha fgmadggj mbd

32
wsoqh bkbn blinmdg
c mbd jafink brjb mdhi
jbmdacadobogifka
jieuscb tbngjj
a khtahka cik
inaskarin
niddr mb
djafi
nka

33
vi
eu mi
hdjbkaj
godbflaka
vblipkajbm
adcalhegifka
ciftdada mbdlah
xka cigrbk wbfikb
euaic ih fiebnnbdrb

34
eaesmbd jac bhedacfinc
kh̄ eihe mhgccbfe qhgo
gesd arfaoadgeb
pjanafe eajjaace
jboijifeaka
lajhg qhg
ldabeih
eskif
ej

35
an
mgda
acechd
eihe mihd
eihcjac cga
ljackac cgal
jac eifjaogead
amifkdb bnaf
ehmjbladbc chdebeaea

36
bhaljbnbgfrbhluajbt
guhdaqhaeadanaeedb
eifjaogea bjidc cg
eifbnaaceodbg
nafemhda ajja
cajaoadb eh
eacafegd
bic gf
img
da

37
eh
mdae
adbchf
aidagjj
abeeafegoa
beihe laqhaj
acacmdgecbadg
afc wcihttadife b
gbfe cigakaedbladka
jbkdigeabjbrbhluachdh

38
fajbnakb gdb gfeihc
jaclbd bleadac gfc
mgdac qhaehpa
fgdbc afchg
ea mbd lac
niec c
iga
w

39
p
afg
cmbi
euaic eh
fajac linn
hfgqh adbc bma
dciffa lbdehead
afkdigc gfkgrfakanb

40
pifea kgogfas ehf bhd
igc mbc jac hll
ac qhaeh bcipe
afk acmadad
ehmd afkd
bc b
ji
de

41
jb
tgr
hd aqh
g aeigec
hd ebeaea bo
al jbnananb
gf ehjbegafkdbc
bkahxnb gfcs mdicea

42
dfa afbkid begifehmdi
fifladbc lacebd
bleadac
bhfe nkaj aea
dfaj kh kga
hodbg n
bgeda
ka

43
n
if
idmc n
if bna s
nif acmdge
bjjay bjjay af
mbgx daegday oi
hc qh hfkaoihcn bl

44
linmbrfaeihuihdc qh
ajac bhedac ciga
fe mdaec boafgd
jidcqha
uajac
dbmm
ajjad
bg